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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/989,957	11/21/2001	Injong Rhee	297/123/2	1668

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EXAMINER	
GREY, CHRISTOPHER P	
ART UNIT	PAPER NUMBER
2667	

DATE MAILED: 07/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

SM

Office Action Summary	Application No.	Applicant(s)	
	09/989,957	RHEE, INJONG	
	Examiner	Art Unit	
	Christopher P. Grey	2667	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 November 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1, 2, 11, 18, 19, 20, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergsson et al. (US 20020071388) hereinafter referred to as 'Bergsson', in view of Aoki et al. (US 6757255) hereinafter referred to as 'Aoki'

Claim 1, 18, 19 Bergsson discloses a sender sending packetized information to a receiver at a first rate and a receiver receiving packetized information using a TCP protocol (paragraph 0017).

Bergsson discloses calculating a congestion window size (0019).

Bergsson discloses periodically transmitting the throughput and rate of change to the transmitter (paragraph 0020).

Bergsson discloses calculating the amount of unacknowledged data based on the throughput and round trip time, where it would have been obvious to one of the ordinary skill in the art at the time of the invention that the throughput can be obtained given the retrieval of the congestion window size and the round trip time.

Bergsson discloses the transmitter adjusting the rate at which packets are sent based on the information fed back from the receiver (paragraph 0020).

Bergsson does not specifically disclose the round trip time being computed in the receiver.

Aoki discloses calculating a transmission speed (element 25 in fig 2) based on a congestion window size and a round trip time (Col 2 lines 25-37). Aoki discloses the round trip time being measured in the position of the receiving side (Col 7 lines 26-41).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the receiver as discloses by Bergsson to implement the timer for measuring a round trip time in a receiver as disclosed by Aoki. The motivation for this modification is to allow the receiver to obtain round trip time information (Aoki- Col 7 lines 10-25) in order to compute a transmission rate within the receiver (see abstract).

Claim 2, 20 Bergsson does not specifically disclose computing an average congestion window size over a predetermined time interval, computing an average round trip time over the time interval, and computing the transmission rate by dividing the average congestion window size by the average round trip time.

Aoki discloses detecting an average congestion window size (Col 7 lines 56-65 and see fig 5).

Aoki discloses measuring an average round trip time over an interval of time (Col 3 lines 10-21).

Aoki discloses calculating the transfer rate by dividing the average congestion window size by the average round trip time (Col 8 lines 45-55).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the receiver as disclosed by Bergsson to include the performance calculating unit for calculating a transfer speed. The motivation for this modification is to calculate the transfer speed in the receiver and calculate an effective bandwidth for the TCP connection.

Claim 11, 27 Bergsson discloses the sender adjusting the transmission rate without receiving per packet acknowledgements from the receiver (paragraph 0010).

2. Claims 3, 4, 5, 6, 7, 15-17, 21, 22, 23, 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergsson et al. (US 20020071388) hereinafter referred to as 'Bergsson', in view of Aoki et al. (US 6757255) hereinafter referred to as 'Aoki' in further view of Mogul (US 6560243)

Claim 3, 5, 6, 21, and 22 Bergsson does not specifically disclose incrementing the congestion window size by one segment in response to receiving a properly sequenced packet from the sender.

Aoki discloses a slow start mechanism (Col 7 line 65-Col 8 line 25). However Aoki does not specifically disclose incrementing the congestion window size by one segment in response to receiving a properly-sequenced packet from the sender.

Aoki does not specifically disclose incrementing the congestion window size by one segment in response to receiving a properly sequenced packet from the sender.

Mogul discloses a slow start phase being implemented in a TCP environment where the congestion window size is incremented by one when acknowledgement of a received packet has occurred (Col 5 line 66-Col 6 line21).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the receiver which acts as a transmitting unit for sending information back to the sender as disclosed by Bergsson, to implement the slow start phase as disclosed by Mogul for determining a congestion window size.

Claim 4 The combined teachings of Bergsson and Aoki do not specifically disclose maintaining a current congestion window size in response to receiving an improperly sequenced packet from the sender.

Mogul discloses maintaining a congestion window size in the event of packet loss (Col 6 lines 12-21).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the combined teachings of Bergsson and Aoki to compute the congestion window size in the event of discarded packet, so that a constant size is maintained throughout the transmission of all the packets.

Claim 7, 23 Bergsson does not specifically disclose a state machine having a congestion avoidance state in which the congestion window size is increased by the inverse of a previous congestion window size in response to receiving a properly sequenced packet.

Aoki discloses a congestion avoidance algorithm where the congestion window size is reduced and incremented by 1 (Col 8 lines 13-25).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the receiver as disclosed by Bergsson to implement the congestion avoidance mechanism as disclosed by Bergsson in order to make an adjustment to the window size.

Claim 15 Bergsson discloses receiving a packet at a receiver and determining the round trip time (paragraph 0035), where it would have been obvious to one of the ordinary skill in the art at the time of the invention that an estimate of the round trip time may be made upon receiving a packet at a receiver, where the round trip time is twice the time recorder from the sender to the receiver.

Claim 16, 17, 31 Bergsson does not specifically disclose computing the transmission rate based on a weighted average of a plurality of congestion window sizes divided by corresponding roundtrip times.

Aoki discloses determining an average congestion window size and corresponding round trip time (see fig 7), where it would have been obvious to one of the ordinary skill in the art at the time of the invention that the most recent congestion window sizes are more important in calculating the average window size, as they depict a more current condition of the window size.

Aoki discloses calculating a bandwidth (rate) by dividing the average congestion window size by the round trip time (Col 8 lines 45-55).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the receiver as disclosed by Berggson, to apply a performance calculating unit as disclosed by Aoki for calculating the bandwidth (Col 8 lines 45-54).

3. Claims 8, 9, 10, 12, 13, 14, 24, 25, 28, 29, 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergsson et al. (US 20020071388) hereinafter referred to as 'Bergsson', in view of Aoki et al. (US 6757255) hereinafter referred to as 'Aoki' in further view of Mogul (US 6560243) in further view of Qaddoura (US 6646987)

Claim 8, 24 The combined teachings of Bergsson, Aoki and Mogul do not specifically disclose implementing a state machine including a gap state reachable from the slow start state and the congestion avoidance state in response to receiving improperly sequenced packets from the sender.

Qaddoura discloses a slow start state transitioning into a timeout (Col 2 lines 12-20), where it would have been obvious to one of the ordinary skill in the art at the time of the invention that the event of a timeout indicates a GAP state.

Qaddoura also discloses a congestion avoidance state transitioning into a timeout (Col 2 lines 21-30), where it would have been obvious to one of the ordinary skill in the art at the time of the invention that the event of a timeout indicates a GAP state.

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the combined teachings of Bergsson, Aoki and Mogul, such that a timeout or the receipt of three duplicate acknowledgements indicates a GAP state as disclosed by Qaddoura. The motivation for this modification is to indicate congestion (Col 1 line 62-Col 2 line 11).

Claim 9, 25 The combined teachings of Bergsson, Aoki and Mogul do not specifically disclose in response to receiving a packet that triggered transition to the gap state, transitioning to the state that the receiver was in prior to the gap state.

Qaddoura discloses in response to receiving a packet that triggered transition to the gap state, transitioning to the state that the receiver was in prior to the gap state (2 lines 12-30).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the combined teachings of Bergsson, Aoki and Mogul, such that a timeout or the receipt of three duplicate acknowledgements indicates a GAP state as disclosed by Qaddoura. The motivation for this modification is to indicate congestion (Col 1 line 62-Col 2 line 11).

Claim 10 The combined teachings of Bergsson, Aoki and Mogul do not specifically disclose implementing a state machine having a fast recovery state reachable from the gap state in which the receiver reduces the congestion window size only once is response to multiple packet losses within a single congestion window.

Qaddoura discloses a fast recovery state reachable from the gap state in which the receiver reduces the congestion window size only once is response to multiple packet losses within a single congestion window (Col 2 lines 30-47).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the combined teachings of Bergsson, Aoki and Mogul, such that a fast recovery state is implemented in order transition from a timeout or triple acknowledgement, to a congestion avoidance state, skipping the slow start state.

Claim 12, 28 Bergsson does not specifically disclose computing an average congestion window size over a predetermined time interval, computing an average round trip time over the time interval, and computing the transmission rate by dividing the average congestion window size by the average round trip time.

Aoki discloses detecting an average congestion window size (Col 7 lines 56-65 and see fig 5).

Aoki discloses measuring an average round trip time over an interval of time (Col 3 lines 10-21).

Aoki discloses calculating the transfer rate by dividing the average congestion window size by the average round trip time (Col 8 lines 45-55).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the receiver as disclosed by Bergsson to include the performance calculating unit for calculating a transfer speed. The motivation for this modification is to calculate the transfer speed in the receiver and calculate an effective bandwidth for the TCP connection.

Claim 13, 29 Bergsson does not specifically disclose dynamically adjusting the predetermined time period based on the state of the receiver.

Aoki discloses the receiver operating in a number of states as disclosed in the rejection of claims 6 and 7.

Aoki also discloses the interval of a fixed time being variable (Col 3 lines 37-57).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the receiver as disclosed by Bergsson to include the performance calculating unit for calculating a transfer speed. The motivation for this modification is to

calculate the transfer speed in the receiver and calculate an effective bandwidth for the TCP connection.

Claim 14, 30 The combined teachings of Bergsson, Aoki and Mogul disclose the fixed time interval being variable as disclosed in the rejection of claim 13. However the combined teachings of Bergsson, Aoki and Mogul do not specifically disclose dynamically adjusting the predetermined time period including setting the time period equal to a the time difference between a first time period when the receiver enters a slow start state or congestion avoidance state and a second time when the receiver reenters the slow start or congestion avoidance state.

Qaddoura discloses a retransmission timer that expires and restarts in the event of a timeout (Col 2 lines 25-30).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to set the time interval as disclosed by the combined teachings of Bergsson, Aoki and Mogul, to the timer's value from the time it is restarted to the time it expires. The motivation for this modification is to compute a congestion window during the time period when the receiver is in a given state.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher P. Grey whose telephone number is (571)272-3160. The examiner can normally be reached on 6:30-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on (571)272-3179. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christopher Grey
Examiner
Art unit 2667

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7/11/05